

**WHAT IS CLAIMED IS:**

1. A fusion polypeptide comprising a collagen-binding domain and an epithelial cell proliferation-modulating agent.

5

2. The fusion polypeptide of claim 1, wherein the epithelial cell proliferation-modulating agent stimulates epithelial cell proliferation.

10 3. The fusion polypeptide of claim 1, wherein the collagen-binding domain is a collagen-binding domain of von Willebrand factor.

15 4. The fusion polypeptide of claim 3, wherein the collagen-binding domain of von Willebrand factor comprises the decapeptide WREPSFMALS (SEQ ID NO:1).

20 5. The fusion protein of claim 1, wherein the epithelial cell proliferation-modulating agent is selected from the group consisting of a growth factor, a cytokine, an enzyme, an enzymatic inhibitor, and an antibody.

6. The fusion polypeptide of claim 5, wherein the growth factor is selected from the group consisting of epidermal growth factor (EGF), hepatocyte growth factor (HGF), tumor necrosis factor (TNF-alpha), platelet-derived endothelial

5 cell growth factor (PD-ECGF), platelet-derived growth factor (PDGF), insulin-like growth factor (IGF), interleukin-8, growth hormone, angiopoietin, angiopoietin-1 and vascular endothelial growth factor (VEGF).

10 7. The fusion polypeptide of claim 6, wherein the growth factor is epidermal growth factor (EGF).

15 8. A nucleic acid sequence encoding a fusion polypeptide comprising a collagen-binding domain and an epithelial cell proliferation-modulating agent.

9. The nucleic acid sequence of claim 8, operably linked to a promoter.

20 10. An expression vector comprising the nucleic acid sequence of claim 8.

11. The expression vector of claim 10, wherein the expression  
vector is a retroviral vector.

12. A host cell comprising the nucleic acid sequence of  
5 claim 8.

13. A method of producing the fusion polypeptide comprising a  
collagen-binding domain and an epithelial cell  
proliferation-modulating agent, comprising growing the  
10 host cells of claim 12 under conditions that allow  
expression of the nucleic acid sequence and recovering the  
fusion polypeptide.

14. The method of claim 13, wherein the host is a prokaryotic  
15 cell.

15. The method of claim 13, wherein the host is a eukaryotic  
cell.

20 16. A method for modulating epithelial cell proliferation in a  
subject, comprising administering to the subject a fusion  
polypeptide comprising a collagen-binding domain linked to  
an epithelial cell proliferation-modulating agent.

17. The method of claim 16, wherein the subject is human.
18. The method of claim 16, wherein the subject has a disorder  
5 selected from the group consisting of an ulcerative  
lesion, an inflammatory lesion, a tumor, and arthritis.
19. The fusion polypeptide of claim 16, wherein the collagen-  
binding domain is a collagen-binding domain of von  
10 Willebrand factor.
20. The method of claim 19, wherein the collagén-binding  
domain of von Willebrand factor comprises the decapeptide  
WREPSFMALS (SEQ ID NO:1).  
15
21. The method of claim 16, wherein the epithelial cell  
proliferation-modulating agent stimulates epithelial cell  
proliferation.
22. The method of claim 16, wherein the epithelial cell  
proliferation-modulating agent is selected from the group  
consisting of a growth factor, a cytokine, an enzyme, an  
enzymatic inhibitor, and an antibody.  
20

23. The method of claim 22, wherein the growth factor is  
selected from the group consisting of epidermal growth  
factor (EGF), hepatocyte growth factor (HGF), tumor  
5 necrosis factor (TNF-alpha), platelet-derived endothelial  
cell growth factor (PD-ECGF), platelet-derived growth  
factor (PDGF), insulin-like growth factor (IGF),  
interleukin-8, growth hormone, angiopoietin, angiopoeitin-  
1, and vascular endothelial growth factor (VEGF).

10

24. The method of claim 23, wherein the growth factor is  
epidermal growth factor (EGF).

15

25. A method for modulating epithelial cell proliferation in a  
subject, comprising administering to the subject a  
therapeutically effective amount of a nucleic acid  
sequence encoding a fusion polypeptide comprising a  
collagen-binding domain linked to an epithelial cell  
proliferation-modulating agent.

20

26. The method of claim 25, wherein the subject is a human.

27. The method of claim 25, wherein the subject has a disorder selected from the group consisting of an ulcerative lesion, an inflammatory lesion, a tumor, and arthritis.

5 28. The fusion polypeptide of claim 25, wherein the collagen-binding domain is a collagen-binding domain of von Willebrand factor.

10 29. The method of claim 25, wherein the collagen-binding domain of von Willebrand factor comprises the decapeptide WREPSFMALS (SEQ ID NO:1).

15 30. The method of claim 25, wherein the epithelial cell proliferation-modulating agent stimulates epithelial cell proliferation.

20 31. The method of claim 25, wherein the epithelial cell proliferation-modulating agent is selected from the group consisting of a growth factor, a cytokine, an enzyme, an enzymatic inhibitor, and an antibody.

32. The method of claim 31, wherein said cytokine is selected from the group consisting of epidermal growth factor

(EGF), hepatocyte growth factor (HGF), tumor necrosis

factor (TNF-alpha), platelet-derived endothelial cell

5 growth factor (PD-ECGF), platelet-derived growth factor

(PDGF), insulin-like growth factor (IGF), interleukin-8,

growth hormone, angiopoietin, angiopoietin-1 and vascular

endothelial growth factor (VEGF).

10 33. The method of claim 32, wherein the growth factor is epithelial growth factor (EGF).

34. A tissue graft, comprising isolated tissue comprising epithelial cells treated with a fusion polypeptide

15 comprising a collagen-binding domain linked to an

epithelial cell proliferation-modulating agent.

35. The tissue graft of claim 34, wherein the tissue is epithelial tissue.

20

36. The tissue graft of claim 34, wherein the tissue is intestinal tissue.

37. The tissue graft of claim 34, wherein the tissue is an organ.
38. The tissue graft of claim 34, wherein the collagen-binding domain is a collagen-binding domain of von Willebrand factor.  
5
39. The tissue graft of claim 38, wherein the collagen-binding domain of von Willebrand factor comprises the decapeptide WREPSFMALS (SEQ ID NO:1).  
10
40. The tissue graft of claim 37, wherein epithelial cell modulating agent stimulates epithelial cell proliferation.  
15
41. The tissue graft of claim 37, wherein the epithelial cell proliferation-modulating agent is selected from the group consisting of a growth factor, a cytokine, an enzyme, an enzymatic inhibitor, and an antibody.  
20
42. The tissue graft of claim 41, wherein the growth factor is selected from the group consisting of epidermal growth factor (EGF), hepatocyte growth factor (HGF), tumor necrosis factor (TNF-alpha), platelet-derived endothelial

cell growth factor (PD-ECGF), platelet-derived growth factor (PDGF), insulin-like growth factor (IGF), interleukin-8, growth hormone, angiopoietin, angiopoeitin-1 and vascular endothelial growth factor (VEGF).

5

43. The tissue graft of claim 42, wherein the growth factor is epithelial growth factor (EGF).

44. A method of preparing a tissue graft comprising contacting 10 isolated tissue with an effective amount of a fusion polypeptide comprising a collagen-binding domain linked to an epithelial cell proliferation-modulating agent.

45. The method of claim 44, wherein the contacting is 15 *in vitro*.

46. The method of claim 44, wherein the contacting is *in vivo*.

47. The method of claim 44, wherein the tissue is a skin.

20

48. The method of claim 44, wherein said tissue is an organ.

49. The method of claim 44, wherein the collagen-binding domain is a von Willebrand factor collagen-binding domain.

50. The method of claim 49, wherein the collagen-binding domain of von Willebrand factor comprises the decapeptide  
WREPSFMALS (SEQ ID NO:1).

51. The method of claim 44, wherein epithelial cell modulating agent is capable of stimulating endothelial cell  
10 proliferation.

52. The tissue graft of claim 37, wherein the epithelial cell proliferation-modulating agent is selected from the group consisting of a growth factor, a cytokine, an enzyme, an  
15 enzymatic inhibitor, and an antibody.

53. The method of claim 52, wherein the growth factor is selected from the group consisting of epidermal growth factor (EGF), hepatocyte growth factor (HGF), tumor  
20 necrosis factor (TNF-alpha), platelet-derived endothelial cell growth factor (PD-ECGF), platelet-derived growth factor (PDGF), insulin-like growth factor (IGF), interleukin-8, growth hormone, angiopoietin, angiopoietin-1 and vascular endothelial growth factor (VEGF).

54. The method of claim 53, wherein the growth factor is  
epithelial growth factor (EGF).

5 55. A method of activating a graft comprising contacting an  
isolated tissue with an effective amount of a nucleic acid  
sequence encoding a fusion polypeptide comprising a  
collagen-binding domain linked to an epithelial cell  
proliferation-modulating agent such that said nucleic acid  
10 sequence is expressed in the tissue thereby activating the  
graft.

56. The method of claim 55, wherein the nucleic acid sequence  
is operably linked to a promoter.

15

57. The method of claim 55, wherein the nucleic acid sequence  
is in an expression vector.

20

58. The method of claim 55, wherein the contacting is  
*in vitro*.

59. The method of claim 55, wherein the contacting is *in vivo*.

60. The method of claim 55, wherein the tissue is epithelial tissue.

61. The method of claim 55, wherein the tissue is the lining  
5 of the digestive tract.

62. The method of claim 55, wherein the collagen-binding domain is a collagen-binding domain of von Willebrand factor.

10

63. The method of claim 62, wherein the collagen-binding domain of von Willebrand factor comprises the decapeptide WREPSFMALS (SEQ ID NO:1).

15 64. A pharmaceutical composition comprising a fusion polypeptide comprising a collagen-binding domain linked to an epithelial cell proliferation-modulating agent in a pharmaceutically acceptable carrier.

20 65. A pharmaceutical composition comprising a nucleic acid sequence encoding a fusion polypeptide comprising a collagen-binding domain linked to epithelial cell modulating agent in a pharmaceutically acceptable carrier.